API Climate Challenge Program

California Energy Commission

2005 Energy Report Committee

Climate Change Workshop

July 12, 2005

API Climate Challenge Program

- Formally established 1/10/2003 in letter to the Secretary of Energy
- Three key components
  - Climate Action Challenge
  - Climate R&D Challenge
  - Climate Greenhouse Gas Estimation and Reporting Challenge

Climate Action Challenge (I)

- "Actions that help reduce our industry's GHG intensity in the near-term" – *consistent with Administration's approach*

- **Goal**: While meeting the nation's energy needs, improve aggregate energy efficiency of member's refinery operations 10% over 2002-2012.

Climate Action Challenge (II)

- **Goal:** 100% of oil & gas sector membership develop GHG management plans.

- **Goal:** 100% participation in EPA's Natural Gas Star program and CHP Challenge program.

Climate Action Challenge (III)

- Other participation options include:
  - Reduce methane venting/flaring
  - Reduce methane emissions from operations
  - Expand cogeneration (CHP)
  - Expand carbon capture/storage
  - Improve energy efficiency

Climate Action Challenge (IV)

- Continued….
  - Increase production of low-CO2 natural gas
  - Use alternative technologies
  - Produce alternative energy forms
  - Participate in voluntary conferences and government programs

Climate R&D Challenge

- Undertake R&D “to create new options for reducing GHG intensity in the longer-term”
  - Participating companies pledge to integrate GHG considerations into R&D decision-making process to impact the trend in operations GHG intensity.

Climate R&D Challenge (II)

- Options include:
  - Advanced energy efficient technologies
  - Alternative energy technologies
  - Alternative motor fuels and vehicle technologies
  - CO2 capture/storage technologies

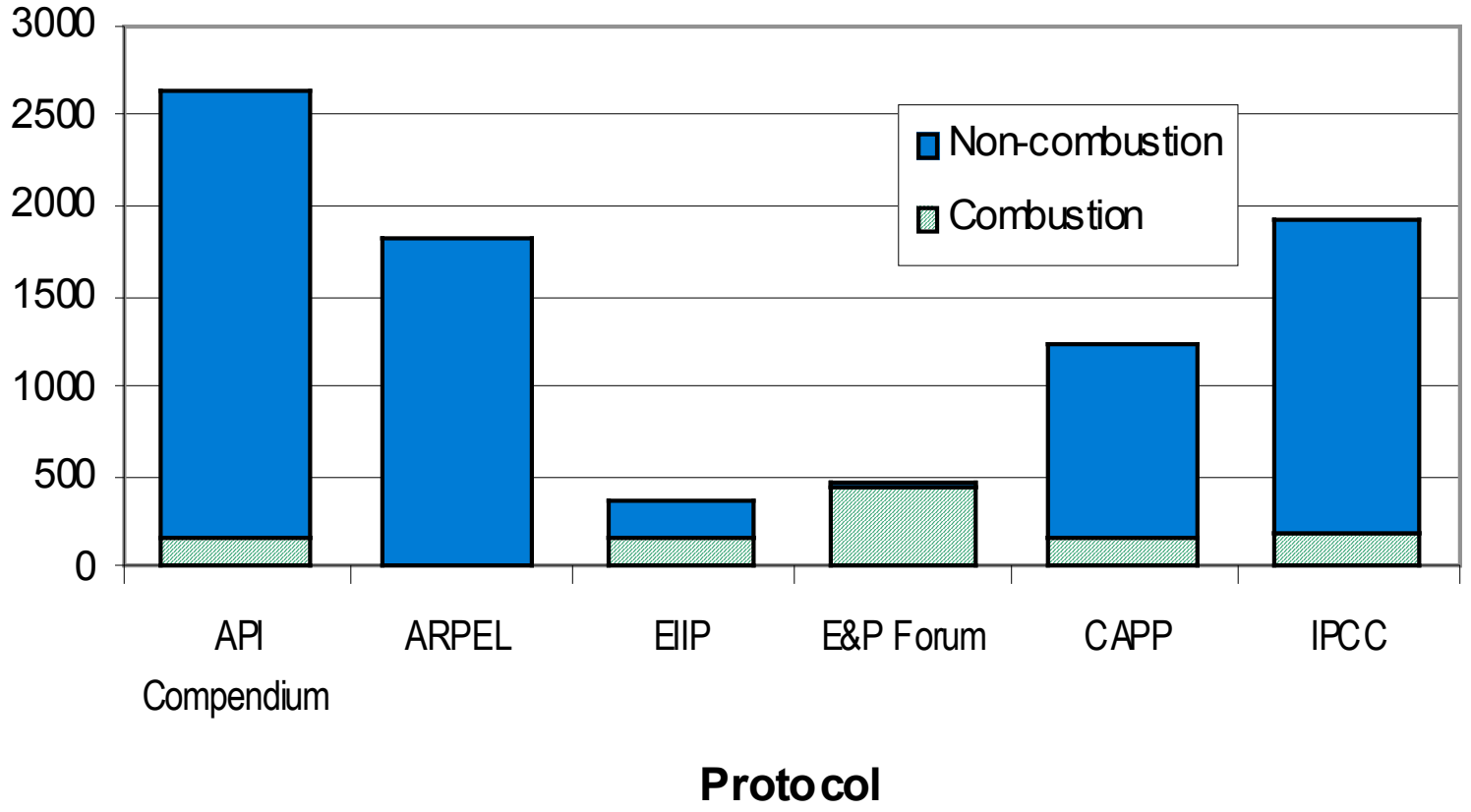
Climate GHG Estimation and Reporting Challenge

- Create consistent and sound basis for estimating and managing GHG emissions.

- *Why is consistency and soundness a concern?*

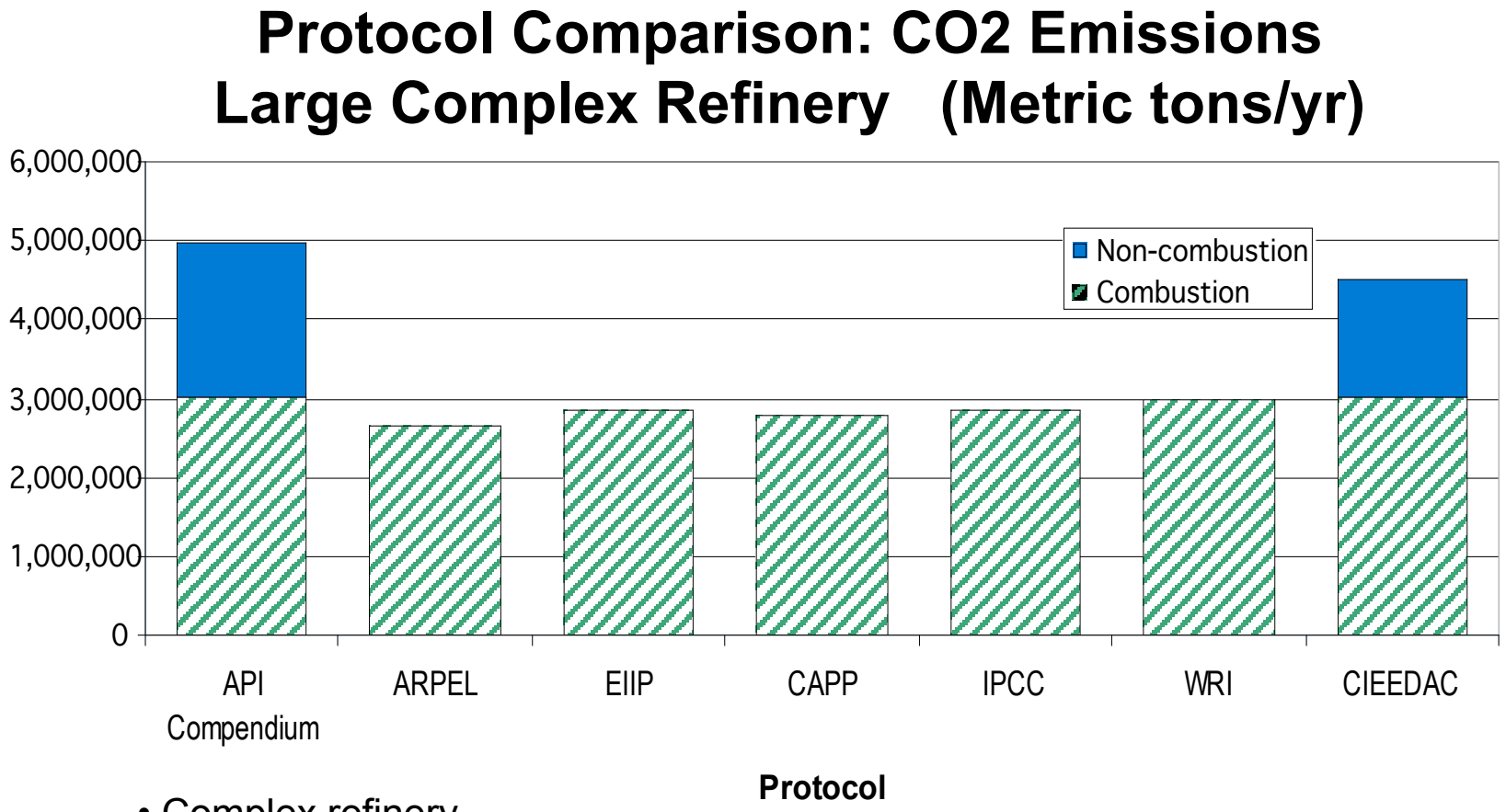
Climate GHG Estimation (II)
Because…

Protocol Comparison: Onshore Oil Production Facility Methane Emissions (Metric tons/yr)



Climate GHG Estimation (III)

Because…

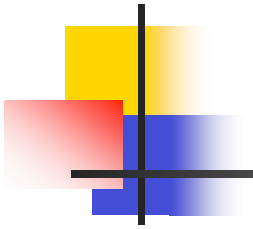


- Complex refinery
- Crude throughput 250,000 bbl/day

Climate GHG Estimation and Reporting Challenge (IV)

- Goal: 100% member participation
  - Utilize *Compendium* (and IPIECA/API/OGP *Guidelines*) worldwide
  - Report US GHG emissions and activity factors to API for aggregate reporting as well as blind comparison for internal company use.

The Three *Really* Hard Parts of the Challenge Program



- Doing (members plus API)
- Tracking
- Communicating

GHG Estimation Examples

- *Guidelines* (IPIECA/API/OGP)
- *Compendium* (API)
- Software Tools –> ghg.api.org
- Application:
  - GHG Reduction Case Studies:
    cogeneration – tank flashing losses – fugitive leak detection and repair – pneumatic device retrofit – refinery heater/boiler combustion tuning – flaring -- sequestration

GHG Estimation Examples (II)

- DOE 1605b General and Technical Guidelines – comment on drafts – *Compendium* recognition
- Outreach to registries on methodology – e.g., WRI, IPCC, Calif. Registry, Canadian Program
- Outreach to technical experts (conferences)

Industry Action Examples

- 90% of upstream and 95% of downstream member volumes participating
- 100% participation in Natural Gas Star
- Support for EPA Natural Gas Star, Methane to Markets, and World Bank/GGFR
- CO2 sequestration/enhanced oil projects in Wyoming

Industry Action Examples (II)

- Company-wide energy efficiency programs
- CO2 capture/storage project in Algeria
- Increased solar, wind and LNG production in US and abroad
- Reduce natural gas flaring and venting
- Increased natural gas/elec production in Africa

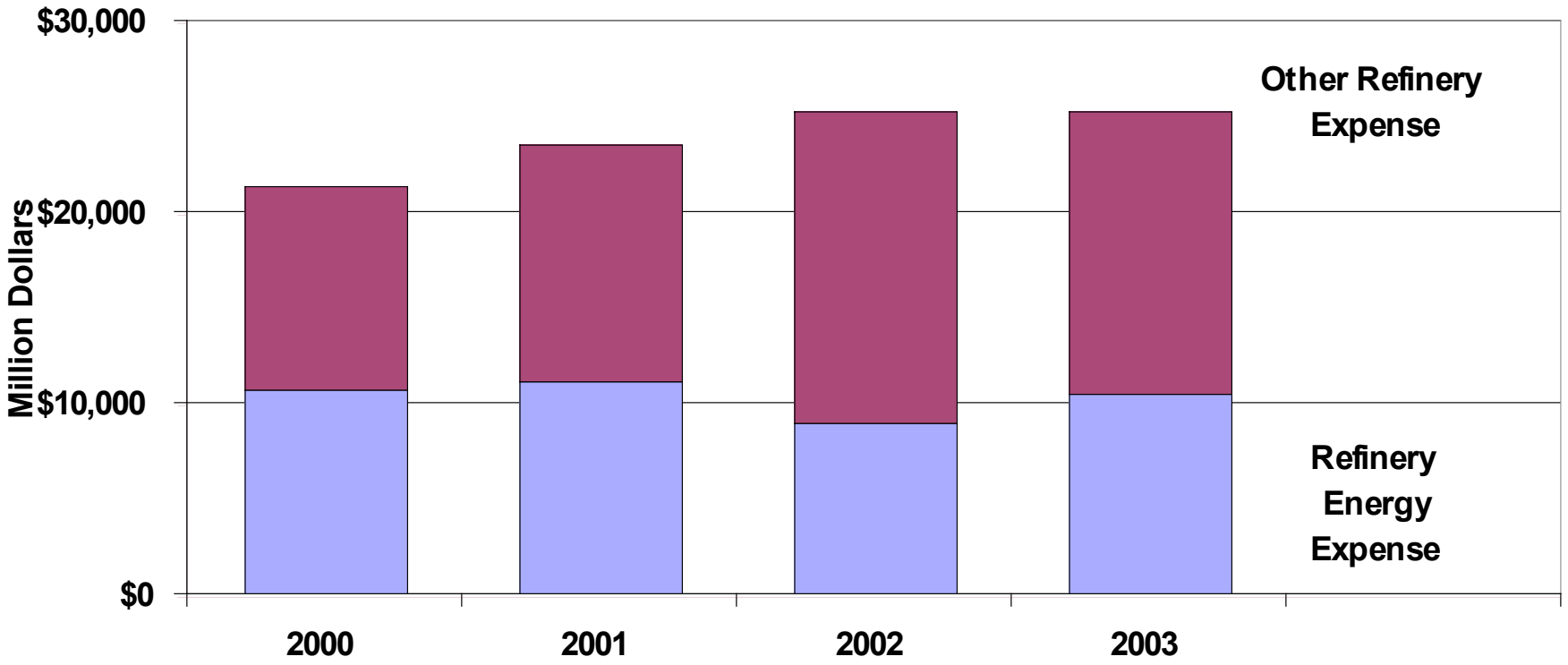
Industry Action Examples (III)

- Offset projects – tree planting
- Increased production of renewable/elec energy (including geothermal)
- Increased Cogen (CHP)
- Vehicle/fuel technologies, e.g., FreedomCar, H2 Fuel Cells, Calif. fuel Cell Partnership, …
- H2 production technologies

Industry Action Examples (IV)

- Academic-type research initiatives
  - MIT – Carbon Sequestration
  - MIT – Joint Program on Science & Policy
  - Princeton – Carbon Mitigation Initiative
  - Stanford – GCEP
  - CO2 Capture Project
  - GEODISC – underground CO2 storage
  - IEA Weyburn CO2 Monitoring & Storage

Energy Expenses Averaging 44% of Refinery Operating Expenses



EIA, *Financial Reporting System.* Excludes raw materials costs.
www.eia.doe.gov/emeu/perfpro/btab32.html

Oil & Gas Cogen (CHP) in California (as of 1999)

	Facilities	MW Cap.	% Nat.Gas
Upstream	48	2,641	> 83%
Downstream	17	1,502	> 71%

Challenges & Lessons

- Quantifying voluntary actions isn't easy – especially R&D efforts
- API focuses on US actions -- but companies undertaking diverse and globally cost-effective options
- Emissions reporting can be costly and raise confidentiality issues
- GHG inventories don't provide emission reduction cost information